In the claims:

1. -21 (Canceled)

22. (Previously presented) A quadrature polarized antenna array, comprising a plurality of antenna elements, each element comprising a plurality of electric dipoles arranged at a predetermined angle with respect to one another and a plurality of magnetic dipoles arranged at said predetermined angle with respect to one another, and wherein each magnetic dipole substantially shares a common location with a respective one of said electric dipoles, the antenna array , having connected thereto a signal preprocessor for preprocessing signals from said antenna for obtaining spatial spectrum information for signal source location, the preprocessor comprising:
a sensor type autocorrelator configured for forming signal autocorrelation matrices for each sensor type, and
a smoother configured for smoothing said autocorrelation matrices, thereby to form at least one covariance matrix comprising spatial spectrum information.

23. (Currently amended) The antenna array of claim 22, having connected thereto a source locator configured for using said ~~sample~~at least one covariance matrix in an eigenstructure-based signal source localization technique.

24. (Currently amended) The antenna array of claim 22, wherein said smoother is further configured to apply forward backward smoothing to said covariance matrix, thereby to increase a maximum number of signal sources that is~~can be~~ localized.

25. (Original) The antenna array of claim 23, wherein said preprocessor is further able to use a steering vector together with said covariance matrix in said source locator.

26. (Canceled)

27. (Previously presented) A method for preprocessing incoming signals obtained using a plurality of different sensor types, the signals including coherent signals, the preprocessing being for source localization, the method comprising

obtaining angle of arrival and polarization information of incoming signals from sensors of each of said different sensor types, forming signal autocorrelation matrices for each sensor type, and smoothing said autocorrelation matrices, to form therefrom at least one covariance matrix suitable for use in eigenstructure-based signal source localization techniques.

28. (Original) The method of claim 27, further comprising applying forward backward averaging to said covariance matrix, thereby to increase a maximum number of signal sources that can be localized.

29. (Original) The method of claim 27, further comprising obtaining a steering vector for use together with said covariance matrix in said eigenstructure-based signal localization techniques.

30. (Original) The method of claim 27, wherein said obtaining is from four sensor types.

31. (Original) The method of claim 30, wherein said four sensor types are two respectively orthogonal electrical dipoles and two respectively orthogonal magnetic dipoles.

32. (Original) The method of claim 31, wherein said four sensor types are all arranged for sensing in a single plane.

33. (Original) The method of claim 27, comprising using source localization information obtained from the data of said covariance matrix as an input to a beam director to provide a directed beam to a respective source.

34. (Currently amended) The method of claim 27, wherein said incoming signal is a noise signal, the method further comprising using source localization information obtained from said covariance matrix as an input to a beam director to provide a null of a directed beam to a respective source of said noise ~~interference~~ signal.

35. -38. (Canceled)

39. (Previously presented) Apparatus for preprocessing incoming signals obtained using a plurality of sensors of different sensor types, the signals including coherent signals, the preprocessing being for source localization, the apparatus comprising an input for obtaining angle of arrival and polarization information of incoming signals from sensors of each of said different sensor types, a sensor type autocorrelator configured for forming signal autocorrelation matrices for each sensor type, and a smoother, configured for smoothing said autocorrelation matrices , thereby to form at least one covariance matrix suitable for use in eigenstructure-based signal source localization techniques.

40. (Original) The apparatus of claim 39, wherein said smoother is further configured to apply forward backward averaging to said covariance matrix, thereby to increase a maximum number of signal sources that can be localized.

41. (Original) The apparatus of claim 39, further able to use a steering vector together with said covariance matrix in said eigenstructure-based signal localization techniques.

42. (Original) The apparatus of claim 39, wherein said sensor types comprise four sensor types.

43. (Original) The apparatus of claim 42, wherein said four sensor types are two respectively orthogonal electrical dipoles and two respectively orthogonal magnetic dipoles.

44. (Original) The apparatus of claim 43, wherein said four sensor types are all arranged for sensing in a single plane.

45.-47. (Canceled)